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SECOND SERIES VOL. 11, No. 8

BULLETIN

OF

THE NEW YORK ACADEMY OF MEDICINE

INCORPORATED 1851

AUGUST, 1935

PUBLISHED MONTHLY BY

THE NEW YORK ACADEMY OF MEDICINE

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Entered as second-class matter, February 3, 1928,
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BULLETIN OF
THE NEW YORK
ACADEMY OF MEDICINE

VOL. 11 AUGUST, 1935 No. 8

JOHN HUGHLINGS JACKSON *

FOSTER KENNEDY
New York

I have been honorably instructed by this Academy to remind us all that this year represents the hundredth anniversary of the birth of a very great figure in medical science;— I refer to John Hughlings Jackson whose name is familiar to you all as having first described and explained the nature of focal convulsions. As a very young man I had the honor of knowing Jackson, then a consulting physician to the National Hospital in London.

We are still too near the 19th Century to be able properly to appraise it but many now are beginning to realize that this Century in England represented a Periclean age in which great poets sang and great novelists wrote; in which natural law began to be understood and applied to the material needs of man. We have so inherited the amazing mental innovations then instituted,—they have become so much the warp and woof of our own mental lives that we are hardly aware of how those men changed the world. We read Darwin's writing and are inclined to think "this is old stuff" without quite perceiving that, like Aeolus, Darwin caused a new wind to blow through the murk of notions that we inherited from the middle ages. Of the same band of prophets is Hughlings Jackson, who might

* Read before the Stated Meeting of The New York Academy of Medicine, April 4, 1935.

be called the Father of Neurology; an Argus-eyed observer with a passion for detail and a brooding intelligence enabling him to see general law emerging from the details, he represented in himself the spirit of science in medicine. It was said of him that "Jackson's guess was worth ten men's facts"; an epigram which, like all epigrams, was only half true since Jackson did not guess but saw facts he associated with fire and accuracy, and his intelligence like a single horn probed to the heart of their mystery.

In the making of the house of the physiology of the brain he was an adventurous engineer, he gathered the materials for the building, he dug foundations,—but even more was he a builder of flying buttresses. His observations by the bedside and in the autopsy room told him where lay the motor areas in our brains. At a time when the function of the basal ganglia was entirely unknown, he rightly knew that in them lay the secret of chorea.

In the most philosophical of his writings, he came to the conclusion that, not only had the nervous system been evolved from the primitive nervous system of the lower vertebrates by the addition of new parts, but he perceived physiological and philogenetic differences in the various levels of the nervous system so constructed.

It is proper also to say that this great scientist was also a great doctor. In our days we are being importuned to believe that investigation must be cloistered and that truth can only be found by those who formally devote all of their day to hospital and university work. Hughlings Jackson and his contemporaries were not so closeted; they kept in touch with the adventure of life and out of that adventure they plucked truth for our benefit.

On this day one hundred years ago, Hughlings Jackson was born and the World is the better for that birth.

Symposium on Headache:

THE ROLE OF DISEASES OF THE NASAL ACCESSORY SINUSES IN HEADACHE *

JAMES W. BABCOCK
New York

In considering the relationship between the nasal accessory sinuses and headache, an accurate definition of headache should be attempted. The dictionary definition of headache is practically only, "a pain in the head." As Doctor Tilney will point out, it is difficult to tell what pain really is and I feel reluctant to further complicate matters by trying to differentiate between headache and pain in the head. This seems desirable however as sinusitis may cause a definitely localized pain in the face or a part of the skull, that is quite different from the more or less general pain present, chiefly in the skull or behind the eyes in headaches from most other causes, although sinusitis may give rise to the latter type of headache.

First it seems desirable to describe the typical pain produced by sinusitis and its usual locations varying with the sinus or sinuses involved. In the time of its occurrence, the pain of sinusitis is almost unique, in that it is usually worse in the middle of the day and tends to spontaneously improve or disappear in the late afternoon or evening. This is not always so in very severe cases and at the onset of acute sinusitis. The apparent explanation of its diurnal character is the relief obtained by spontaneous drainage after the patient's being up and about eight or ten hours. Pain from sinusitis is nearly always increased when the head is low. The amount of pain present is not always commensurate with the severity of the inflammation of the involved sinus. A very little involvement may give rise to great pain and a sinus may be full of almost pure pus and

* Read before the Stated Meeting of The New York Academy of Medicine, April 4, 1935, as a part of a symposium on headache.

no pain at all be present. The usual location of pain from involvement of the different sinuses with, of course, any combination, depending upon whether one or several sinuses may be involved is as follows: The frontal sinus usually causes pain right where it is located in the forehead and almost always limited to the side involved. In passing, I would like to call attention to the accompanying tenderness being greatest on pressure on the roof of the orbit mesial to the supra-orbital notch and to the fact that pressure on the supra-orbital nerve always produces pain and is no sign of sinusitis. The maxillary sinus, on the other hand, is more apt to cause pain above the eye than in its real location, although it is often enough present in the upper jaw. It is particularly felt in the upper teeth on a jar to the body, such as induced by stamping the heel on the floor. To bring in tenderness again, the infra-orbital nerve suffers somewhat as the supra-orbital nerve does in misguided attempts to elicit tenderness in maxillary sinusitis. There is only a small area of the anterior wall of the maxillary sinus available for pressure just lateral to the ala naris. The pain with sphenoidal sinusitis is more variable, probably due to the adjacent spheno-palatine ganglion through which pain may be felt at very diverse locations. Typically it is in the occipital region of the involved side, but may be in the vertex, or ear, or behind the eye of the involved side. Sphenoidal sinusitis is frequently accompanied by a psychic depression as well as headache. The ethmoid cells should be considered as divided into an anterior and posterior group. Involvement of the former gives rise to pain between the eyes chiefly but often in the frontal region also. The posterior group more usually causes pain behind the eyes or in the vertex. However, since the ethmoids are rarely involved alone, pain arising from their inflammation is usually overshadowed or accompanied by the pain due to involvement of the sphenoid in the posterior group and the frontal or maxillary sinus or both in the anterior group.

Pain may arise from various conditions affecting the sinuses which may be classified as follows:

Acute and chronic inflammation, due to infection, the most common group.

Mechanical means such as a slight engorgement of the mucosa at the orifice of a sinus not permitting air to enter and the absorption of the air contained, causing a decreased pressure in the cavity and engorgement of the lining membrane. This is admirably described by the late Dr. Sluder but the frequency or importance of it as a cause of headache is sometimes disputed. Pressure within the nose from a swollen mucosa whether inflammatory or due to an allergic reaction should come under this heading as should the presence of a foreign body or tumor.

Scars within the nasal or sinus cavities at times produce considerable pain.

Pain following irradiation of the bones containing the sinuses, due probably to a resulting periostitis may occur. I know of one man, who after being treated for papillomata in the maxillary sinus by radium, had such severe and persistent pain, that he considered having an operation on his Gasserian ganglion eight years after treatment.

I have tried to describe the more usual types of headache associated with sinusitis and will describe some of the atypical forms which are very variable and numerous. This is especially true in involvement of the sphenoid or posterior ethmoid cells. Here the pain may be a diffuse headache or pain localized to almost any part of the head or face, even the lower jaw. At times, the pain with maxillary sinusitis may be referred to even a single normal tooth. This is not surprising when one realizes that the roots of some of the upper teeth raise prominences in the floor of the antrum. It is rare for the pain to be felt on the opposite side of the head to the involved sinus but this may occur.

I have purposely omitted any detailed attempt to explain the variability of the locations of the pain in sinusitis anatomically, partly because in some instances I would be unable to do so.

Pain very like that produced by sinusitis may be caused by a great variety of other conditions. Prominent among them are dental lesions, particularly impacted third molars, although their favorite referred pain seems to be in the ear. Eye lesions, particularly errors of refraction may cause headaches similar to those of sinusitis, the particulars of which will be described by Dr. Weeks. The headaches with nephritis and high blood pressure may be confusing. At the onset of various febrile diseases, such as typhoid fever, or typhus, headache may be the chief symptom and be misleading. With influenza, this headache is frequently due to a concomitant sinusitis. In migraine, the differential diagnosis is usually aided by the accompanying visual symptoms or nausea and by the irregularity of its occurrence; also its propensity to be relieved instead of increased by pressure. Frontal sinusitis has been closely simulated by trichinosis with particular invasion of the orbicularis palpebrarum muscle. In another case an arterio-venous aneurism within the orbit was nearly operated upon for sinusitis with orbital cellulitis. Headache with intracranial lesions is less apt to simulate that of sinusitis but the variability of pain with sphenoidal involvement may lead to confusion. Neuritis and myositis particularly of the trapezius may simulate sinusitis and indeed be secondary to it.

Headache may be attributed to other causes and turn out to be due to sinusitis. An example of that is the case of a young woman who was rendered unconscious by a fall from a horse giving her a definite concussion. A persistent headache followed this and occasioned much worry and distress and finally ceased after the cure of a low grade maxillary sinusitis.

The treatment of headache is to be discussed by Dr. Kennedy and so I only wish to bring out the point that in cases where the headache is due to sinusitis, the best way to effect a cure is to cure the sinusitis rather than adopt any palliative measures.

Although sinusitis may at times be readily diagnosed by a description of the headache accompanying it, this symptom is so often atypical and even absent, that the diagnosis should not be made without a complete examination of the sinuses, for overflow of pus or mucus from the normal opening of a sinus, diseased mucosa, around its orifice, eliciting tenderness, transillumination. Radiographs or even diagnostic irrigation may be, in obscure cases, advisable to eliminate sinusitis. Topical cocainization of the sphenoid region may relieve spheno-palatine neuralgia when little or no disease of the sphenoidal sinus can be demonstrated.

Sinusitis may be responsible for a comparatively small percentage of all headaches. However, it would be a mistake to omit an examination of the sinuses in endeavoring to find the cause of obscure headaches.

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OCULAR HEADACHE *

WEBB W. WEEKS
New York

Ocular headache is well described as that acute discomfort in and about the head that directly or indirectly results from organic or functional disorder of the visual apparatus.

It has been thought that this is a reflex pain due to a stimulation of the endings of the nasal branch of the ophthalmic division of the fifth cranial nerve being reflected along other branches of this nerve, that changes in the eyeball are felt as pain in the region of the brow by way of the supra-orbital nerve and pain felt deep in the skull is reflected along the dural branches of the fifth nerve. Michaelson's study into the pain of visceral reflex origin concludes that the mechanism which underlies the ciliary headache is analogous to that which gives rise to referred visceral pain in other parts of the body, more particularly that ciliary headache arises from ciliary dysfunction in the same way as angina pectoris arises from cardiac dysfunction. In his study Michaelson showed that ciliary muscle contraction, relaxation, and fatigue could stimulate this pain and produce a dull aching throb (43), a sharp knife-like pain (24), a heavy tired feeling (10), and a tight, gripping feeling (8) (as seen in occipital aches of hyperopic astigmatism). He found that the degree of pain in a visceral reflex depends on the changing nervous excitability of the nervous system, local and general: locally, at the particular level of the cord, being sensitized by afferent stimuli; and generally, due to a central nervous system more sensitive from toxic conditions, overwork, lack of sleep, mental worries, and sexual disturbances.

Fenton brings forward the rôle of the sympathetic in ocular headaches as follows. The network of vessels in and about the eye is accompanied by a delicate network of sympathetic fibrils controlling vascular tone. Among these

* Read before the Stated Meeting of The New York Academy of Medicine, April 4, 1935, as part of a symposium on headache.

vegetative nerves are interspersed end organs of sensation, which report mechanical pressure, edema, hemorrhage, passive or active hyperemia, as well as the pressure due to infection and inflammation, whether superficial or exudative. Local toxins (bacterial, chemical, resultants of body wastes, fatigue, or perverted metabolism) have similar irritant effects upon these sensory terminals. In general, then, ocular headache from, in or about the eye is representative of local pathology which is often actuated through the sympathetic system, while it is reported to the area where the headache is felt through the fifth cranial nerve and its connections. Perceived within or about the cranium, it may, by reflex stimulation of the sympathetic at the perceiving area, set up local vasomotor disturbances within the dural envelope, which may greatly aggravate the intensity of the original headache. Conversely, conditions within the brain or along the sympathetic or sensory nerves may activate perceptory mechanisms within or about the eye, thus producing irritations or congestions which appear local.

In the average ophthalmological practice about 30 to 60 per cent of headaches are of functional origin. Next to visual defects this headache is the commonest symptom to bring the patient to an oculist's office. Or the patient is sent for an eye examination by the physician who finds no physical cause, or by the neurologist whose findings do not explain the headache.

There is no doubt but that headache due to ocular functional or organic states can be ruled out by a careful and thorough ophthalmological examination, especially if, first, defects be discovered on a complete local examination, and if, secondly, one considers the immediate physical surroundings, the general physical and neurological conditions present, and the original background, physical status, inheritance, etc.

The location of headaches of ocular origin is supraorbital, 75 per cent of all bilateral frontal headaches being due to eyestrain associated with the use of the eyes. In

order of frequency, the sites of election for these headaches are supra-orbital, deep orbital, fronto-occipital, and temporal regions. The unilateral supra-orbital ache is usually not due to eyestrain. But it is often most difficult to say that a given headache is primarily or secondarily ocular in origin. Where accommodative or focusing effort goes beyond the reserve of the ciliary mechanism a frontal headache is apt to result, whereas when the muscles adjusting the eyes to single binocular vision are overtaxed occipital or cervical headache may ensue.

As to the character of the ocular headache, there is no pathognomonic feature, but it is suggestive, especially when associated with other signs or symptoms of ocular disturbance. This headache may be constant or periodic, of long duration or of shorter periods, or occur at regular or at irregular intervals. The personal and family habits often are of great value, though usually one finds that ocular headaches are associated with eye use. We cannot get away from the fact that we are dealing with functional conditions where we have a great variation not only in the powers of different individuals, but also at different times and under different conditions in the powers of the same individual. An error of refraction which will cause much discomfort of various sorts in one person will in a subject with a more stable makeup produce no symptoms worthy of notice.

The local factors involved in the production of ocular headaches are:

1. Disturbances of refraction and accommodation.
2. Disturbances of ocular motility.
3. Disturbances of retinal function.
4. Congestive states in and about the eyeball.

As Lancaster aptly describes it, in refractive and accommodative dysfunctions we have to consider: the lens with its elastic support (zonular fibers); the ciliary muscle which controls the tension of this elastic support and so regulates the anterior curvature of the lens; the nerve sup-

plying the ciliary muscle, its primary center, the adjoining and interconnected groups of motor cells and their nerves and muscles which are associated in the act of accommodation.

To obtain *continued,* clear vision an eye must *focus* on the object accurately so as to give a clean cut retinal image at all times and at all distances. Not only that, but to gain perspective, enhancing definition and location in space, the two eyes must be brought into focus at the same time, to the same degree of position and level, so as to have the object simultaneously focused on each macula.

An ametropia (hyperopia, astigmatism, anisometropia, and presbyopia) not easily overcome by an effort of accommodation causes first an interference with clear vision. If the effort is persisted in, a ciliary muscle cramp may develop, as from continued reading or near work by a hyperopic or an astigmatic eye, giving rise to ocular headache. If this near work is carried on during the evening, the symptom may not appear until the next morning.

A hyperopic or farsighted individual with a good reserve of accommodation can see distinctly for distance until this reserve is impaired by local conditions or general health. This reserve is much less for near use and more easily leads to over-exertion and tire, and if efforts to secure clear vision are persisted in, ocular headache ensues.

Ocular headache in young people is more often due to astigmatism than any other cause, up to 75 per cent in the accommodative types of ocular headaches. Varying and unequal contraction of the ciliary muscle (accommodative effort) ends in ciliary muscle fatigue, all in the effort to maintain or gain clear vision, from the confusion of images common to these eyes.

A case in point is headache after near work where no refractive glass is accepted. Use of a cycloplegic and refraction reveal an astigmatism which when corrected relieves the headache. This type of ache shows itself more readily as middle age is reached, as well as in debilitated states.

In hyperopic astigmatism, mixed astigmatism, lastly myopic astigmatism, ocular headache is common, especially where the eyes are used much, but quite unusual in the purely spherical myopia.

All during man's waking hours the unstriped smooth muscle fibers of the ciliary body act with no sensation accompanying the act of accommodation, because of its large reserve power. Over-use of this reserve which physiologically diminishes with age is accompanied by signs of distress—ocular headache.

In presbyopia there is a loss of elasticity of the lens, the range of accommodation or focusing is diminished, and the visual acuity for near work is interfered with. Print has to be held farther away, lighting has to be good, the 3s and 8s, the n's and u's are hard to distinguish. Efforts to read or to do fine work at the usual near point for any length of time are sooner or later attended by headache due to an early fatigue of the ciliary muscle, which relaxes, unable to contract to its full extent. Almost 40 per cent of presbyopes suffer from these focusing headaches. Presbyopia comes about forty-five years of age in the emmetropic, earlier in the hyperopic cases, and later in the myopes. Presbyopia is usually termed a physiological change and yet its early appearance may be the early sign of failing health, as in local or general diseases which affect the neuromuscular system.

The reserve strength of the ciliary muscle is definitely and quickly influenced by the state of one's general health. An emmetropic individual may require a corrective lens to relieve a headache coming on while using the eyes during convalescence from an acute illness, or while suffering from a toxic condition. These lenses are not required when health is regained. Instances of this interference with focusing are seen in adults following an attack of influenza or in children following a siege of measles or scarlet fever. Ordinarily rest restores the function of all over-used muscles; the ciliary muscle, being no exception, may be put at rest with a cycloplegic.

In considering dysfunction of the extra-ocular muscles one has to do with the efforts, neuromuscular, to move and maintain the eyes in the necessary and desirable position for simultaneous, single binocular vision. Here we must consider the muscles moving the eyes and the muscles associated with them as well as their motor nerves, especially the motor nerve cells below the third and fourth ventricles with their elaborate system of inter-communication and co-ordination not only with one another but with the visual nerve centers, auditory and other centers often concerned with ocular movements.

Lancaster emphasizes that it is not merely muscles that are subject to fatigue but that it is also the elaborate intricate system for co-ordination that may be the trouble maker. An exophoria may not be due to a muscular defect but to the management of these muscles by the motor cells or centers. The average healthy individual maintains focusing and the necessary ocular muscle balance for hours at a time. He reads and works at a distance that gives clear vision and keeps up co-ordinate movements of the two eyes, back and forth on a page, focusing and fixing without discomfort, due to a good reserve of muscular power.

The limits of endurance of the focusing and muscular balance mechanisms are reached early and strain follows when one or both have to be content with a handicap, such as in ametropia, which requires not only the additional effort to overcome it but also the usual effort required to focus for the distance of the work. Hence there is the increased effort plus the demands for a more exact and trying adjustment to cause strain. This also occurs when the handicap is poor print, defective lighting, or unsteady objects.

Anything reducing the endurance of the neuromuscular system may end in strain, including general debilitating conditions from diseases of various kinds, overwork, lack of food or sleep, need of outdoor exercise, type of work or lighting and unhygienic surroundings. In a large percentage of cases more than one factor is at work, such as

an error of refraction plus overwork, etc. The proper treatment is the stopping or reducing of the amount of work (or that particular type of work), the building up of general health, the proper refractive correction, or even operation to correct a muscular imbalance.

In considering disturbances of retinal function and congestive states in or about the eyeball, one must remember that a normal eye from early youth and on up to forty years of age adapts itself rather readily to different intensities of light and yet after long usage without periods of rest, under deficient or too high intensities of light (glare) even when accustomed or adapted to them, sooner or later develops fatigue and ocular headache. Under a uniform, steady, average intensity of illumination, such as daylight with natural resting periods, the normal eye is seemingly capable of carrying on indefinitely. After forty years of age—due to neuromuscular, medial, and retinal tissue changes—this adaptation and ease of eye use under variations in illumination become increasingly less.

The congested sick eye suffering an inflammatory disease (such as conjunctivitis, keratitis, iritis, scleritis, glaucoma, retinitis) in the early stages of, during the course of and convalescence from this disease resents light and all efforts of the eye to be used, early ocular fatigue and headache resulting.

A similar hypersensitive condition arises in eyes defective from refractive errors, especially myopic eyes where efforts to see clearly have resulted in retinal hyperemia. Toxic conditions occurring in nephritis, diabetes, alcoholics, intestinal disturbances render an eye less able to carry on its normal visual functions without distress, and doubly so if a refractive error or muscular imbalance already is present.

In the various headaches not found to be due to ocular inflammation or defects one finds in a fair percentage of cases signs in and about the eye which may aid in the proper placing of the causative factor: the ocular-muscle paralyses; the visual and visual-field defects; optic atrophy

or optic papilledema or neuritis, or neuro-retinitis arising from intracranial accidents, inflammation or growths; adjacent sinus disease; or the results of general toxic or infective states; poisoning by alcohol and tobacco, drugs; cerebrospinal lues; diabetes; etc.

In conclusion we find that:

No single theory settles the point as to why certain ocular conditions cause pain or headache in the various regions of the head where it is said to be felt.

Inasmuch as other cranial disturbances may cause pain in similar areas of the head, location of the headache is of relatively little assistance in diagnosis.

Ocular headache may occur in the presence of excellent vision and when the refractive error is of comparatively insignificant amount, due to unconscious efforts of the patient to overcome this error and to his hypersensitive nervous system.

The incidence of headache due to disturbed ocular functions being high renders it advisable to thoroughly examine the eye and its adnexa as a possible cause, even to applying the therapeutic test of a lens correction.

In headache there is almost always more than one causative factor present. Eyestrain may be the easiest of these to remedy, and that may be sufficient because the other factors—such as illness, fatigue, age, and overwork—alone may be insufficient to produce headache. Yet it may be necessary to treat all these factors.

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HEADACHE FROM TOBACCO, DRUGS, ETC.*

ALEXANDER LAMBERT
New York

For the many years that tobacco has been used, since its active alkaloid nicotine was recognized as a deadly poison, it was taken for granted that any disturbance in a smoker, which seemed to be possible to trace to the effect of tobacco itself, must be due to the effect of nicotine.

All the writings in our text books, and all the tobacco literature of the past have been based upon that assumption. In recent years evidence has been accumulating which finally seems convincing, that as far as smoking the tobacco is concerned, the deleterious effect on the human organism is more due to some element in the tobacco, other than nicotine, than to the nicotine itself.

There is no question that the blood pressure rises during smoking, and in animal experimentation, small amounts of nicotine cause a rise in the blood pressure, and the coronary, pulmonary, and hepatic vessels are constricted thereby.

The work of Sulzberger and Harkavy, and others, has produced very strong evidence that the clinical effects of tobacco are due to hypersensitization by some substance in the tobacco itself, more than in the smoke, and it seems equally true from their work, that it is not the nicotine which produces all the injurious effects produced by tobacco.

Like all allergins, this unknown substance is inert to normal people, but to any hypersensitized person it may be exceedingly injurious, and the injury seems to be in quantitative relation to the sensitiveness of the individual. Many people smoke practically all their lives with no apparent injurious effects; others find themselves sensitive,

* Read before the Stated Meeting of The New York Academy of Medicine, April 4, 1935, as a part of a symposium on headache.

and have to cease the use of tobacco; others go on, as in the cases of thrombo-angiitis obliterans, in which there is very definite evidence, from the work of these investigators, that it is due to the tobacco, and find themselves crippled for life as a result of the use of tobacco, and their personal sensitization. There seems to be no question that in many examples of allergy, of which tobacco is merely one, the substance taken into the body, by whatever channel, whether it is absorbed by solution of the alkaline saliva from the tobacco in the mouth in cigars and cigarettes, whether it will be found to be due to some substance in the smoke, or in whatever manner it may be introduced, it can go into the circulation, but it has a very strong predilection for some one element in the bodily structure. This point of predilection in tobacco is the vascular system, and both changes in the vessels themselves are present as well as the production of changes in the surrounding tissues from the resulting irregular circulation, and irregularity of blood supply. It is undoubtedly true that the circulating allergin can cause repeated reactions in small circumscribed areas of blood vessels, and these may be found to be in any area in the body.

This is not the place to discuss the various effects of tobacco on the circulatory system, or to discuss its effects in angina, or in thrombo-angiitis obliterans, and other arterial diseases, but it is here a question of the possibility of headache produced by tobacco, and from whence this pain comes.

Compared with the vast number of tobacco smokers that one meets, headache from tobacco is not a wide spread affliction, and tobacco sensitiveness in people in general seems to be somewhere between 20 per cent and 10 per cent, judging from the limited figures so far acquired.

Headache in general has seemed to me to be due to a contraction of the blood vessels in the skin, and a localized contraction, in which the uncontracted arterioles supplying the smaller vessels endeavor to drive a mass of blood through the contracted smaller tubes, causing pain by

pressure on the nerves through this action; or else, if we accept the idea of the allergic action as seen in the urticarial type of allergy, it is due to a pressure of the circulation where there is an actual exudation in the tissues, which produces pressure on the nerves.

There is no question but that smoking raises blood pressure, that is a clinical observation of many years standing long before allergy was conceived to be the basic cause of tobacco poisoning. This rise of blood pressure is produced by stimulation of the sympathetic side of the autonomic nervous system, causing the vasomotor contraction which these nerves control. It has already been demonstrated by Heymans, Bouckert and Regniers that the blood pressure is chiefly controlled by the nervous mechanism of the carotid sinus at the dilation of the internal carotid, where the common carotid separates into the internal and external vessels, and at this junction there is a small so-called gland, or glomerulus, which is not a secretory gland, but is a vascular organ abundantly supplied with nerves from the sympathetic and vagus systems, especially by branches of the glossopharyngeal nerve. Minute amounts of substances passing through the glomerulus, such as very small amounts of nicotine, so small that they are inert if injected into the blood stream, above the gland, will cause a very marked reaction in the rise of blood pressure. It may be this factor which influences the clinical rise of the blood pressure more than even the excessive sensitization which the unknown substance in the tobacco itself produces. The rise of blood pressure is universal in smokers, and I have seen men with normally markedly low blood pressure, have during the years of their smoking, abnormally high pressures, which again fell to the previous hypotension after the cessation of their tobacco, and remained as before at normal hypotension.

Whatever substance may cause the allergic condition, whatever substance it may be that produces the increased vascular tension, it is a repeated dosage many times a day which finally brings about the changes producing the headache, or producing whatever other symptoms there may be.

The chronic action of tobacco on arterioles may change the vessel wall itself, and headache not occur until this change is established, or the headache may come from the acute local spasm of the vessels, and act as an acute poisoning, occurring only with excess of smoking, or become a chronic headache after many years, and be intensely severe. The headache may only accompany an amount of smoking excessive for that individual. Functional changes produced by tobacco have the same characteristics that other allergic manifestations possess; if the offending poison is withdrawn from the body, the symptoms cease, if then resumed, they again reappear.

How frequently tobacco headaches occur it is impossible to say; excessive smoking will produce them in most people; a person smoking too much at night will wake up with a headache in the morning. Caffein in a good strong dose will dilate the vessels, and the morning cup of coffee will relieve the headache, and usually, enough coffee will be taken to see that it does.

Many headaches which are laid to smoking are unquestionably due to other substances, they may be due to other solids or fluids taken the night before, and are blamed on the tobacco. But headache from tobacco does occur, and is dependent for its occurrence on the quantity taken, and on the sensitiveness of the person indulging in it. We cannot gauge these two factors, we cannot say how frequent it is. It is quickly evident in some, it is never evident at all in others. It may be produced by the nicotine, it may have nothing to do with the nicotine, we do not know; it may be produced by an unknown substance in the tobacco absorbed by the alkaline saliva from the moistened tobacco in the mouth; it may possibly be in the tobacco smoke, but to-day this seems doubtful.

The degree of the tobacco headache rests with the individual, and his idiosyncrasy towards sensitization from the use of the tobacco. Furthermore an individual may be sensitive to only one kind of tobacco, not to other kinds.

The relief and cure of this form of headache rests also with the individual. He may smoke and suffer from it, or leave tobacco alone, and be free, or he may smoke from boyhood till doddering old age, and never have a headache from his smoking.

Headaches from other substances used in daily life as food or drink are not uncommon. Coffee and tea cause headaches in some persons, in others not. Caffein in small doses below 20 mgm. per kilo body weight raises blood pressure, but double this dosage and the vessels are dilated.

Most drugs in use to-day do not give headaches, except the group of hypnotics which are so excessively used leave the benumbed and poisoned cerebral tissues still affected after sleep has ceased, and the hypnotic must be followed by an analgesic to obtain relief. The hypnotic habit like other drug habits, expresses the desire for freedom from the worried wear and tear of life, and does not enter into discussion here.

Sugar gives headaches in some individuals if amounts excessive for that organism are ingested. Other foods, as milk or eggs, and many other substances used as food, produce headaches in individuals hypersensitive to them. The mechanism seems to be the same disturbance of the normal balance between the sympathetic and parasympathetic portions of the autonomic nervous system. The idiosyncrasies of this class of substances is best brought out in the widely increasing literature of Allergy, and is too broad a subject for discussion at this time.

ETIOLOGICAL CONSIDERATIONS OF HEADACHE *

FREDERICK TILNEY
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We have been in doubt about the causes and explanation of headache for a long time. All reliable omens indicate that there is a good bit of doubting still to be done. This admission may seem unfortunate in such an advanced day of scientific revelation. It does, perhaps, carry some degree of reassurance in that doubt is usually the beginning, not the end of wisdom; also because science, quite naturally, solves the easier problems first and leaves the hard, knotty ones like headache for days of fuller maturity.

One pointed question probably goes to the core of the matter. What is the nature of pain? This is an old question but its challenge is as young and fresh as it ever was. The final answer seems a good way off. In recent years some helpful light has been shed on the mechanisms of pain. But this illumination does not bring complete conviction that the structural mechanisms of all kinds of pain, including headache, are the same.

It seems fairly well established that each avenue of sense is accompanied by a parallel sidepath for the conduction of pain, discomfort, or distress. This sidepath is not in constant use during ordinarily comfortable life. On the other hand, it is in constant readiness to spread signals of alarm when a tissue, a part or an organ is threatened by excessive stimuli. The sensory avenue of touch beginning, let us say in the finger, if stimulated by .5 milliamperes of galvanic current gives rise to a sensation of tingling. When the current is increased to 1.5 milliamperes a burning, cutting pain is produced. In his recent important investigations of olfactory sense, Dr. Elsberg has shown that a burning, stinging or distressing sensation in the nose is

* Read before the Stated Meeting of The New York Academy of Medicine, April 4, 1935, as a part of a symposium on headache.

associated with odorous substances. Excessive degrees of light or sound cause pain or discomfort along the pathways of sight and hearing. Extremes of heat or cold are also painful. What is true of these types of sense, is equally true of all other types including visceral sensations derived from the blood vessels, heart and lungs, from stomach, intestines and adnexal organs and from the genito-urinary tract.

It seems obvious that this sensory sidepath for pain fills an important biological office. It provides an emergency apparatus for protection against harmful stimuli. Because of its definite biological importance, this emergency pathway requires a discrete structural set-up concerning which a good deal is already known. This structural set-up is typical of all sensory pathways. It consists of a receiving apparatus in the peripheral parts of the body with conducting systems in the peripheral nerves and transmitting mechanisms through the neuraxis into the optic thalamus. Thence it passes upward to discriminating areas in the cerebral cortex where the exact location of the pain is identified, its character is recognized and the proper reaction to it is provoked.

In general, the neurones for the conduction of pain belong to the small and medium sized fiber systems of the cerebro-spinal nerves, sympathetic system and neuraxis. It is probable that some, at least, of the larger sized nerve fibers conduct pain impulses. Many fine fibers make their way in or along the walls of blood vessels, some of which serve to convey impulses of pain. The existence of these pain fibers is now as well established as the neuraxones of similar character in the walls and substance of the viscera.

Thus the perception of pain arising from most parts of the body, depends upon a unitary conduction system. This system is susceptible of irritation at numerous points along the pain pathway. The irritable points best known and most common in experience are the sensory end organs in and about the surfaces of the body. Irritants affecting the peripheral nerves, both somatic and visceral, as well as the

nerve roots and ganglia are capable of producing intense pain such as occurs in certain types of neuritis and in herpes zoster. Irritants involving these more outlying parts of the pain pathway are said to produce peripheral pain. Central pain, on the other hand, occurs when certain parts of the central nervous system are the sites of abnormal conditions. Some lesions in the spinal cord and more notably in the optic thalamus are accompanied by pain or extreme degrees of distress.

The irritants active in the production of pain fall into two large groups, *i.e.,* mechanical and chemical factors. The mechanical factors, in the main, include puncture, laceration, pressure, constriction, compression and distension. The chemical factors embrace a wide variety of intrinsic and extrinsic substances. In the final analysis the mechanical irritants may prove to be reducible to a chemical basis.

Out of these considerations an important leading question arises. Do pains in the head, including headache, depend upon the same unitary neural organization as is operative elsewhere in the body and called into play by the similar mechanical and chemical factors? In part the answer to this question is strongly in the affirmative. It is in the affirmative with reference to the dura mater. All of the parts of the head such as the cranial and facial bones, the scalp and skin of the face, the oral and nasal cavities with the accessory sinuses are equipped with a typical pain pathway. The brain, however, offers a different proposition. Its tissue has been looked upon as insensitive to ordinarily painful irritants and this insensitiveness has long been attributed to the absence of the pathways essential to the typical pain mechanisms. Admitting its other well known idiosyncrasies, the brain in this light is a structural oddity. Being the exponent of all human suffering, it stands immune to the direct sting of pain. Such was the belief until modern investigations gradually modified this view.

Gulland (1898), Huber (1899), Stöhr (1930), Hassin (1930) and Penfield (1931) all described nerve fibers in

the blood vessels of the pia mater. This proof brought the possibility of nerve fibers for pain one step nearer to the brain itself. Huber distinguished two types of fibers; first, medullated fibers which end in non-medullated branches which he considered sensory and second, non-medullated nerves which he considered vasomotor. Stöhr found a rich plexus of nerves in the arteries, veins and capillaries of the pia mater and also in the chorioid plexuses. The existence of nerve fibers derived from the sympathetic system in the blood vessels which traverse the brain was first demonstrated by Penfield (1932). In the past few months Deery (1935) has given further convincing proof of nerve fibers in the walls of blood vessels which pass through the substance of the brain. In addition to these fibers he has also observed long and apparently medullated elements passing from the ependymal cells which line the ventricles. There is still much dispute concerning the nature of these nerve-like structures connected with the lining of the ventricles. I am strongly inclined to believe, however, that they represent medullated nerve fibers probably sensory in character. According to these newer disclosures it seems almost certain that sensory fibers make their way through the brain in the walls of the blood vessels. The existence of sensory fibers connected with the lining of the ventricles, although it must still be held subject to many reservations, has suggestive significance. With these facts in mind it is no longer necessary to regard headache arising from causes within the brain substance as due exclusively to irritation of sensory nerve fibers in the dura mater or pia mater.

Dr. Elsberg (1935) in studying the etiology of headache injected air into the ventricles. Using the encephalographic technique he found that headache occurred most often at the time when the air entered the third and lateral ventricles. This fact indicates that there is a probable connection between such headache and the presence of air in these ventricles. Differences in the location of the headache were observed when the head was placed in different positions.

If, for the moment, a unitary structural organization is accepted as essential for the reception, transmission and perception of all pain impulses, it is possible to survey the etiology of headache in certain comprehensive groups such as headaches due: 1, To causes affecting the head directly; 2, To causes arising in or primarily affecting parts of the body other than the head; 3, To causes incident to lumbar puncture and injection of air; 4, To causes called psychogenic.

It is probable that expanding lesions in the brain are, from many points of view, most important among the causes affecting the head directly. Intracerebral lesions of this kind include brain tumors, abscesses and cysts. The headaches produced by them stand out conspicuously in the long list of human pains. Often they are accompanied by other disturbances such as nausea and vomiting, progressive loss of sight, depreciations in motor and sensory functions, changes in personality, and impairment of reason and consciousness.

Because they are due to foreign bodies growing in definite regions of the brain such headaches tend to become localized and sometimes have areas of local tenderness connected with them on the surface of the skull. Frequently the headache of brain tumor has a location corresponding to the location of the new growth. The pain may be on one side of the head, in the frontal, in the parietal or in the occipital region. In tumors of the posterior fossa the pain often extends from the occiput into the cervical region. Headaches due to brain tumors are usually not continuous in their duration. They are characterized by a certain degree of periodicity. Remissions of considerable length are not infrequent. The headache tends to come on in the early part of the day and diminishes in severity toward evening. Several days or irregular intervals of time may elapse between the severer attacks. These intervals may be entirely free of pain. The patient is then encouraged to believe that he is improving only to be undeceived by a recurring headache of even greater

intensity. Physical exertion or nervous strain is likely to bring on the pain or increase its severity. These are the classical conceptions concerning the pain caused by brain tumors. All of the accepted traditions and teachings about this kind of pain have been contradicted time and again in actual experience.

Brain tumor headaches are subject to so many and such confusing variations that no hard and fast rules can be laid down for their identification. They may be entirely absent even in patients suffering from large growths which compromise extensive areas of the brain. The pain may be so diffuse as to have no localizing or diagnostic significance whatsoever. It may be continuous and thus without remissions or periodicity. Often it is shifting in its location, now in one place, now in another or occurring in regions of the head diametrically opposite the site of the lesion.

The idea that the headache of brain tumor has a definite and fixed character as to location, time of occurrence, intensity, duration and accompanying symptoms is a thoroughly misleading belief. If huge tumors often exist without producing headaches, so relatively small ones may cause the most severe pain. This and similar contradictory features are difficult to explain. Many differing factors inherent in the nature of brain tumors must be considered before any attempt at explanation can reasonably be made. Among these factors are the general location of the tumor, its relations to the ventricular system and to the meninges, its histological character, its rate of growth as well as the tissue reactions in and around it. Tumors which by their proximity to the ventricular system block the flow of the cerebro-spinal fluid readily cause a distension of the brain by overfilling of the ventricles. Neoplasms which actually invade the brain tissue usually expand more rapidly than those derived from the dura. These latter grow insidiously. They slowly compress the brain and frequently attain a great size before their presence is detectable. Reactions about a tumor such as edema, vascular congestion and proliferation or extravasation ac-

count for the differing conditions which surround the growing mass. Variations in these factors suffice to explain the difference of tension to which the brain is subjected from time to time.

From the facts known at present, it seems probable that a competent sensory mechanism for the conduction of pain impulses exists in the coverings of the brain, within the brain tissue itself and it may be, in the lining of the ventricles. The headache caused by cerebral compression or distension as the result of brain tumor may thus be interpreted in terms consonant with pain perception arising from other parts of the body.

Brain abscess is somewhat more consistent than brain tumor in its tendency to produce headache. On the other hand, small abscesses and even abscesses of comparatively large size in a quiescent stage often fail to cause pain. Furthermore the headache of brain abscess, although generally more significant than that due to brain tumor in localization of the lesion, may be entirely misleading in this respect. The pain caused by abscess in the brain is generally regarded as more severe than that of cerebral neoplasms but fluctuations in duration and intensity are common to both lesions. Here again it is not merely the presence of the abscess in the brain which causes the pain but quite as much the coexistence of various other tissue conditions associated with the lesion. Variations in intracerebral tension as the result of changes in the hemal and lymphatic channels occasion congestion, extravasation and edema of differing degrees at different times. Similarly changes within the abscess causing expansion offer another group of variable factors. In other words, the sum total of the biological factors of a brain tumor or abscess are not constant but, as in any other living structure, are continuously changing. These changes are determined by the nature of the foreign body in the brain whether it be tumor or abscess and by the reactions of the surrounding brain tissue to the foreign body. From this standpoint it is relatively simple to interpret the fluctuating character and duration of the headache.

Cysts of the brain whether parasitic or occlusive, possess the same tendency to expand as do brain tumors and brain abscesses. They are especially prone to cause headache when so situated as to block or impede the flow of fluid in the ventricular system.

Other pathological changes in the brain accompanied by headache are: Hemorrhage into the ventricles or into the chorioidal plexuses: Traumatic or spontaneous subarachnoid hemorrhage: Hemorrhage into the substance of the brain which determines the apoplectic seizure. In such cases headache usually precedes the stroke and ceases with the suspension of consciousness. If the patient survives and regains consciousness, headache of some degree of intensity may persist for a relatively long period.

Headache either diffuse or fairly well localized is of common occurrence in all forms of encephalitis. Infiltration of the perivascular lymph spaces is sufficient to occasion widespread changes in the circulatory apparatus of the brain with attendant changes in cerebral tension.

Vascular diseases of the brain, especially those giving rise to aneurysms of the basilar artery or other vessels connected with the circle of Willis are often accompanied by headache. This is also true of advanced cases of arteriosclerosis, more particularly of those instances in which there is a marked degree of lime deposit in the larger vessels.

The headache of cerebral syphilis is most likely chargeable to meningo-vascular type of this infection. Pituitary headache has acquired a well established clinical reputation. Its explanation on the basis of transitory swellings of the pituitary gland seems as improbable as it is fantastic. An endocrine dysfunction of the hypophysis affecting the cerebral circulation recommends itself more strongly as the cause of this kind of headache.

Conditions outside of the brain but confined to the head are frequently the cause of headache. The mechanism underlying such pain is readily understood. A typical

pain pathway is provided in every instance whether it be in the dura, the scalp, the bones of the head and face or the air spaces connected with the nose and ear. The causative factors may be inflammations as in meningitis, sinusitis or mastoiditis, head-injuries or even cranial growths outside of the cranial cavity. In each instance the pain impulses leading to headache are conveyed by a neural apparatus similar to that utilized for pain conduction elsewhere in the body. This explanation seems to be well founded on well established facts.

There are, however, several large groups of headache which leave much room for reasonable doubts as to the neural mechanisms involved. Such doubts apply especially to causes which primarily affect or arise in parts of the body other than the head. Prominent among these conditions are the hypertensive disorders in which the chief morbid changes are in the arteriolar bed. Here the principal exciting factors appear to be fatigue, overexertion, and strain especially of the mental type. The more subtle influences which underlie these headaches are believed to be chemical in nature but their symptomatic effects are looked upon as the result of circulatory changes in the brain. In this sense it is probable that the usual neural mechanism for pain is utilized in the development of hypertensive headaches.

A large range of toxemias has been held responsible for headache. The toxemias associated with febrile conditions are well established in this connection. Equally well known are the toxemias whose activities are not associated with fever. Many toxins of this kind have their origin within the body. The chief source of such trouble is almost universally recognized as the gastro-intestinal tract with the kidney and liver standing well in the forefront. Other toxins, in general less blamelessly acquired, include alcohol, tobacco, morphine, codeine, amyl nitrite, nitroglycerine, lead and carbon-monoxide. It is difficult to draw the line limiting the list of exogenous toxins, for much depends upon conditions connected with ingestion as well as upon the idiosyncrasy of the individual.

The causes of migranous headaches have been the subject of long and earnest discussions. Dr. Riley has recently given the matter thoughtful and scholarly consideration. The nearest approach to conviction about these headaches seems to be that they may be either of endocrine, toxic or allergic origin. Fuller and more satisfying explanations must wait upon further developments in the solution of the headache problem. The allergic possibilities which open up in this connection are especially worthy of notice. They fit in particularly well with the condition described by Dr. Kennedy in which localized edema of the brain in response to special sensitization produces definite cerebral symptoms among them severe headache. This possibility should, in fact, be kept to the fore in seeking the explanation of all headaches presumably of toxic origin.

It is unfortunate that two diagnostic procedures, which ought to be helpful in the problem, have furnished somewhat conflicting evidence. The injection of air into the ventricles for encephalography often produces severe headache. The severity of the pain seems to be in proportion to the amount of air injected. Dr. Elsberg, as already stated, has shown that headache under these circumstances is due directly to the presence of air in the third and lateral ventricles. The location of the pain moreover bears a definite relation to the position of the injected air. Even more familiar is the headache following lumbar puncture. The pain in this case seems to be due to the withdrawal of cerebro-spinal fluid, i.e. a depletion of the ventricular content. It is probable that all of the factors operative after lumbar puncture have not yet been recognized. Ultimately the differences in the two procedures may be brought into harmony and shed more light on the role of the cerebral ventricles in headache.

Still less clear is the explanation of the reflex headaches due to eye-strain. It is almost impossible to attribute their occurrence and localization to the usual neural mechanism for pain. Even more in doubt is the explanation of headaches due to distortion of structural relations in the female pelvis.

Living as we do in what is, perhaps, the most neurotic city in the world—a melting pot of Nordic, Alpine and Oriental races, striving together in avid competition and goaded by the opportunities of a superlative seaport—is there any wonder that so many suffer from headache—is there any wonder that so much of it is put down as psychogenic? The headache called psychogenic has many qualities worthy of consideration. It is thoroughly in sympathy with the rush and hurry of modern life. It is a smooth diagnosis with which to gloss over contemporaneous difficulties. In time, it ripples off the tongue so readily that it requires no cerebral process to guide its use. On nearer view, however, psychogenic, like idiopathic, proves to be a smoke screen cast over our lack of understanding. It is admirably adapted to the needs of the hurried practitioner. It does not, however, look beyond the exigencies of the moment to discover what biological processes may have gone astray or what actual physiological abnormalities may have arisen from the stress of such extremely exacting life. Psychogenic headache as a diagnosis is deserving of a reasonable share of doubt until its clinical entity is more securely established and its mechanism more clearly defined.

Although many types of headache may be explained on a unitary neural basis, other types cannot be interpreted so readily in this way. It seems wisest, therefore, to maintain a conservative attitude in the question of etiology. It may at length be necessary to call upon several widely different interpretations to explain the several clinical varieties of headache.

DRUGS AND OTHER METHODS OF TREATMENT*

FOSTER KENNEDY
New York

The treatment of headache like most things in medicine resolves itself into a problem of diagnosis. In a sense there can be no proper treatment for "headaches" without specific regard for the cause. There are nervous, irritable, highly strung persons whose way of life may be corrected by the imposition of an hour's rest in the afternoon or almost better still by lying down for 15 minutes before and after each meal. This rest period not only should be free of interruption by man, beast or telephones but the patient should know before hand that no intrusion is possible. The world is too much with us, and none of us is enough alone. Further, as duodenal ulcers can follow hard on the heels of emotional stress, so can headache, especially of the constant "steelband" or frontal "helmet" type. It must be the physician's task to try delicately to unravel the skein of circumstances and allow—if the Fates be kind—some gentler pattern to be woven.

At Bellevue Hospital some years ago an investigation was made on persons with skull defects to discover the influence of sleeping, waking, and the administration of drugs on the rise and fall of pressure within the skull. It was found there, first, that the act of falling asleep coincided with an increase of intracranial pressure; the act of waking coincided with a fall. Second, the administration of caffein by hypodermic produced a marked drop in intracranial pressure, a circumstance which explains the action of caffein in making sleep difficult. Third, it was found that the opium derivatives greatly increased intracranial pressure and that amyl nitrite increased this pressure more than any other drug—which makes the routine use of such a vasodilator in

* Read before the Stated Meeting of The New York Academy of Medicine, April 4, 1935, as a part of a symposium on headache.

hypertension more hazardous than helpful. Fourth, that intravenous 25 per cent glucose solution by vein changed the osmotic dynamics of the body fluids, dehydrated the brain, and reduced intracranial pressure and the headache that came with and from it.

It would seem that about one-third of all migraine victims have other members of their family similarly afflicted. This corresponds to the inheritability of the allergic constitution. Not nearly enough attention is paid to the problem of allergic headache. Eyerman (*Jour. of Allergy,* vol. ii, No. 2, Jan. '31, p. 106) carefully studying 63 cases of chronic and frequent headache found that in 69 per cent the pain was greatly lessened or failed to appear when certain and specific foods were omitted from the diet and recurred when these foods were eaten deliberately. One of the officers of this Academy suffered most of his life from a not severe, dull headache which appeared daily about 10 A.M., and disappeared before lunch. Not till a prolonged visit to Europe and the substitution of rolls and coffee for his daily egg did he discover tardily the origin of his discomfort. In another place I have arranged what seems to my mind sound evidence for believing that the morbid process in migraine is a localized allergic œdema implicating painfully the meninges and especially their foldings and angled reflexions emanating probably from the brain tissue itself. However, the detail of these happenings would take us too far afield; enough here to speak of one of our Bellevue patients with recurring ophthalmoplegic migraine—the meningeal crevice of the sphenoidal fissure presumably dropsical—recovered from symptoms and maintained good health by an "elimination" diet and had immediate return of pain and local palsies on resumption of the offending protein. (Foster Kennedy, *N. Y. State Journal of Medicine,* November 1st, 1933.) Dr. Mary O'Sullivan working at Bellevue Hospital has found ergotamine tartrate a 90 per cent specific for the migrainous seizure—the cure being often dramatic and ending the attack whether it be ordinarily a 5-day or 1-day episode. This is not achieved by anaesthetizing qualities, for one of our men with severe toothache at

the time of his migraine lost under gynergen (trade name) the latter but not the former, and another of our patients with a gun-shot wound of the brachial plexus causing constant ulnar pain who also suffered from migraine was relieved in his occasional migraine and to his disgust always retained his more embarrassing causalgia. The headaches of constipation are a commonplace to every physician and to multitudinous laymen. The morbid process causing the head pain to come from intestinal stases is less clear—it may well have an allergic basis and we remember that Soma Weiss and Pickering have uniformly produced violent headache by histamine injections.

Sinus headache is commoner in America than Europe; its diagnostic features would take too long to give here—the referred focal occipital pain from a diseased sphenoid should be remembered. I can't help wondering if the English habit of wide open bedroom windows transferred to centrally heated American houses is not responsible for the great incidence of sinus trouble here; our bedrooms are often in winter 30 degrees colder than our day rooms—and our masters, the shirt makers, cut pyjama necks so low that the jugulars and carotids are hard put to it to avoid being pipe-frozen: there would be more sense in leaving off pyjamas and wearing a muffler instead! However, if we should so cater to nudity and the French fear of courant d'air at one and the same time our Anglo-Saxon mores would indeed be in jeopardy! "Eyestrain," I suspect is blamed for more headache than it causes; but Ames of Dartmouth by his iconometer has been helpful in giving information in these matters.

The treatment of headache, as I said at the start, is that of causes: Rheumatic headaches with Heberden-like nodes under the scalp are commoner than is supposed and yield readily to salicylates. I think the most frequent cause of pain in the back of the neck and lower occiput is septic teeth and tonsils. Local skull pain persists sometimes after head injury from the formation of cerebro-meningeal adhesions, and these occasionally are broken up by the technique of

spinal air or oxygen insufflation. I mentioned the referred pain produced by periapical abscessed teeth, but should remind myself also of the grave violent headache often caused by pulpitis—a pain in its severity apparently equal to that of trigeminal neuralgia. Nocturnal syphilitic headache is less common now because of Ehrlich's beneficence, but severe headaches often come from inadequate sleep and undue fatigue. The headaches of the menses and uterine malpositions have only to be referred to. Hypertensive headache may be relieved soon by splanchnic operation—this would seem the right path but we must go down it further for clear knowledge. Head pain due to low barometric pressures is hopeless except for rest, cold baths and aspirin. A word on drugs: acetanilide is a poison and bromoseltzer a menace. Aspirin, phenacetin and caffein citrate are harmless to nearly everyone in ordinary dosage (5 grains of each for one dose—seldom used). Pyramidon can cause agranulocytosis and should be used cautiously. Luminal helps the nervously strained; a simple alkaline effervescent is a good habit—exercise is a better—and perhaps a tranquil mind is the best of all.

LETTERS OF SAMUEL HAHNEMANN

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REUEL A. BENSON

Two unpublished letters of Samuel Hahnemann, the founder of Homeopathy, have been presented recently to the Academy of Medicine by Mrs. E. K. Dunham, through Dr. Samuel Lambert. These interesting letters were addressed to Hahnemann's pupil and colleague, Dr. Giuseppe Mauro, at that time a practicing physician in Naples, and himself the author of the first book based on Hahnemann's teachings to be written in Italian. Apparently the letters passed from Dr. Mauro to Dr. R. Rubini of Naples, and by him were presented in 1876 to Dr. Carroll Dunham of New York, father of the late Dr. E. K. Dunham. Dr. Carroll Dunham (1828-1877) was a distinguished physician and writer on medical subjects, and a former Dean of the New York Homeopathic Medical College. He travelled extensively in Europe, and organized the first International Homeopathic Congress in 1876. Of Dr. Rubini we know little, but his name will recall to the older generation the "Rubini Camphor pills," which held first place, in the family medicine chests of thirty years ago, as a sovereign remedy for colds.

At the time these letters were written, Hahnemann (Christian Friedrich Samuel Hahnemann, 1755-1843) was living in the German city of Coethen, under the patronage of Ferdinand, Duke of Anhalt-Coethen, who gave him the title of "Hofrath," and made him court physician. For many years, since in 1790 Hahnemann had first voiced what Sir John Weir calls his "glorious discontent" with the therapeutics of his day, he had been hounded from town to town by the apothecaries, who resented his bitter antagonism to polypharmacy and drugging; and had been ridiculed by the conventional practitioners of the period, because of his opposition to blistering and bleeding, the accepted treatment for all diseases. Now, at last, at the age of 75, he

found himself in a friendly community, with financial and intellectual security, his days filled with visits from patients who flocked from all over Europe to consult him. His "Organon" had been translated into five languages; his favorite nephew, Dr. Trinius, was physician to the Russian Czar; his friend, Curie (father of the discoverer of radium), was editing the first Homeopathic Journal in Paris. To the little cottage in Coethen came a constant procession of hungry-minded physicians, hoping to find an escape from their medical discontent. Among others, Dr. Valentine Mott, the celebrated New York surgeon, visited him, and after his return wrote, "Hahnemann is one of the most accomplished and scientific physicians of the present age."

In 1832 Hahnemann was made an honorary member* of the "Medical Society of the City and County of New York," and was presented with a Latin diploma. It is interesting to note that this honor from the medical profession in New York was indirectly responsible for his second marriage. At the age of eighty he married Melanie d'Hervilly Gohier, a French woman of thirty-five. Albrecht, his German biographer, writing in 1851, says of her, "On a visit to the Paris Bourse one day she learned that Hahnemann had been appointed President of the Medical Faculty of New York. Then she immediately said to herself, 'Where the man lives I must go, I must investigate this.'" She journeyed posthaste to Coethen, became a grateful patient, and ultimately the bride and exploiter of Hahnemann during his senile years.

We have a graphic description of Hahnemann, written by Dr. Griesselich of Karlshruhe, who visited him in Coethen in 1832:

> Hahnemann at the age of seventy-seven showed in every action all the fire of a young man. No trace of old age could be detected in his physical appearance, except the white locks surrounding his temples, and the bald crown, which is covered with a velvet cap. Small, and sturdy in form, Hahnemann is lively and brisk; every movement is full of life. His eyes reveal his inquiring spirit; they flash with the fire of youth. His features

* This action was rescinded one week after Hahnemann's death.

are sharp and animated. As old age seems to have left few traces on his body, so it is with his mind. His language is fiery and fluent; often it becomes vehement as a stream of lava against the enemies and opponents, not of himself personally, for that he never alluded to, but of the great truths to the testing of which he had summoned his colleagues for many decades. His memory seems to be unaffected; after long interludes and side conversation, he continues where he left off.

When he becomes heated in conversation, which often happens, whether about friend or foe, or on scientific subjects, his words flow forth uninterruptedly, his whole manner becomes extremely animated, and an expression appears on his countenance, which the visitor admires in silence. Perspiration covers his lofty brow; his cap is removed; even his long pipe—his trusty companion—goes out and must be relighted by the taper that is at hand kept burning all day. But the white beer must not be forgotten. The venerable old man had so accustomed himself to this sweet drink that it always stood in a large covered glass on his table; at his meals, too, he takes this drink, which is unknown in South Germany. He does not drink wine; his mode of life is very simple, abstemious and patriarchal.

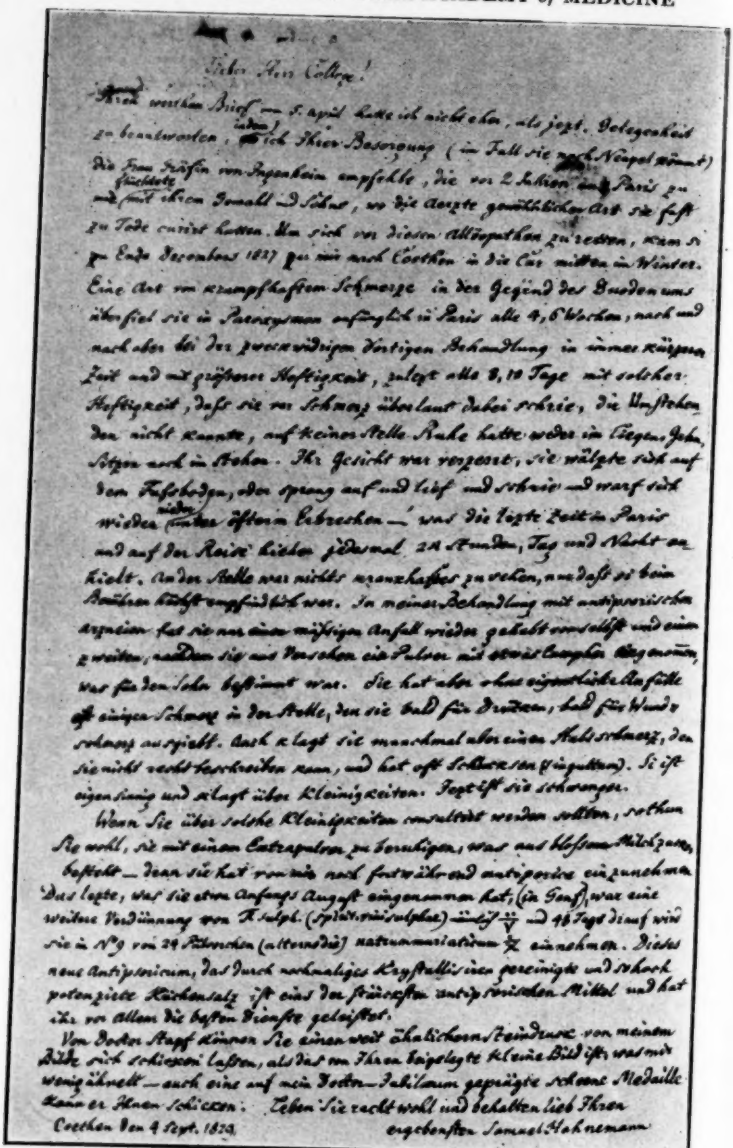
Like all Hahnemann's letters these two specimens show his characteristic "copper plate" handwriting on rough but well preserved letter paper. They were written with an unsplit quill, and although they are in German, the English script is used instead of the German, probably because they were written to a foreigner. Although Hahnemann was fluent in both French and Italian, he seems always to have preferred to write and converse in his native language, and he urged his followers to do the same. He would no doubt repudiate the following translations.

To Dr. Giuseppe Mauro in Naples

Dear Friend and Colleague:

I have just received from our mutual friend, the distinguished Counsellor von Gersdorff, your charming present, the pictures of exquisite fruit and flowers, and I thank you for the proof of your constant affection and esteem, which I hope I may never lose.

You have imparted to us a splendid account of your treatment of a woman suffering from Hemiplegia, and I send you my hearty approval. You wish some advice from me in regard to her continuing incapacity to speak, and it will give me great pleasure if I can help. It seems far more likely that the defect lies in the memory centres than in the speech organs, because if the latter were at fault, you would have seen an improvement after the use



Lieber Herr Collega!

Ihren werthen Brief — 5. April hatte ich nicht eher, als jetzt, Gelegenheit zu beantworten; (aber) ich Ihrer Besorgung (im Fall sie nach Neapel kömmt) die Frau Fürstin von Ingelheim empfehle, die vor 2 Jahren aus Paris zu mir (nach Köthen) flüchtete, wo die Aerzte gemüthlicher Art sie fast zu Tode curirt hatten. Um sich von diesen Allopathen zu retten, kam sie zu Ende December 1827 zu mir nach Cöthen in die Cur mitten im Winter. Eine Art von krampfhaftem Schmerze in der Gegend des Duodenums überfiel sie in Petersburg anfänglich in Paris alle 4, 6 Wochen, nach und nach aber bei der zweckwidrigen Aerztlichen Behandlung in immer kürzerer Zeit und mit größerer Heftigkeit, zuletzt alle 8, 10 Tage mit solcher Heftigkeit, daß sie vor Schmerz überlaut dabei schrie, die Umstehenden nicht kannte, auf keiner Stelle Ruhe hatte weder im Liegen, Sitzen noch im Stehen. Ihr Gesicht war verzerrt, sie wälzte sich auf den Fußboden, oder sprang auf und lief und schrie und warf sich wieder (nieder) (unter öfterm Erbrechen — was die letzte Zeit in Paris und auf der Reise beides jedesmal 24 Stunden, Tag und Nacht anhielt. An der Stelle war nichts schmerzhaftes zu sehen, noch dasselbe bei äußerm Berühren höchst empfindlich war. In meiner Behandlung mit antipsorischen Arzneien hat sie nur einen mäßigen Anfall wieder gehabt, worauf sie eine zweite, nachdem sie aus Versehen ein Pulver mit etwas Campher (Tag) genommen, was für den Sohn bestimmt war. Sie hat aber ohne eigentliche Anfälle oft einigen Schmerz in der Stelle, den sie bald für Drücken, bald für Wundsein schmerzhaft angiebt. Auch klagt sie manchmal über einen Kahlschmerz, den sie nicht recht beschreiben kann, und hat oft Schlucken (Hiquitus). Sie ist eigensinnig und klagt über Kleinigkeiten. Jetzt ist sie schwanger.

Wenn Sie über solche Kleinigkeiten consultirt werden sollten, rathen Sie wohl, sie mit einem Extrapulver zu beruhigen, was aus bloßem Milchzucker besteht — denn sie hat von mir noch fortwährend antipsorica einzunehmen. Das letzte, was sie zum Anfange August eingenommen hat, (ein Gran) war eine weitere Verdünnung von K sulph. (sphär. viii sulphur) — dieß ♆ — und 48 Tage darauf wird sie in № 9 von 24 Pillenchen (alternirend) natrum muriaticum ♄ einnehmen. Dieses neue Antipsoricum, das durch vielmaliges Krystallisiren gereinigte und schon potenzirte Kochsalz ist eins der stärksten antipsorischen Mittel und hat uns vor allem die besten Dienste geleistet.

Von Doctor Rapf können Sie einen recht ähnlichen Steindruck von meinem Bilde sich schicken lassen, als das von Ihnen beigelegte kleine Bild ist, was mir wenig ähnelt — auch eine auf mein Doctor-Jubiläum geprägte schöne Medaille kann er Ihnen schicken. Leben Sie recht wohl und behalten lieb Ihren

Cöthen den 4 Sept. 1829. ergebensten Samuel Hahnemann

LETTER FROM HAHNEMANN DATED 4 SEPT., 1829

(Slightly Reduced)

of Calcarea. As the difficulty evidently lies in the thought and memory processes, I think you will have more success with Lycopodium $\frac{0}{X}$ inhalations every fourteen days (in all only some two or three times), and also Euphrasia $\frac{0}{X}$ and Anacardium given in the same way. At least, this is my hope; and I have already found these remedies of service in similar circumstances. The patient must not fail to go out of doors every day, regardless of weather. She will also profit by having a robust, healthy-minded person lay both hands flat on the crown of her head for one minute every morning (Mesmerism).

And now I wish you the best of health, so that you may continue to gratify your noble zeal in the propagation of our beneficent art in saving the sick.

Your true friend,

Samuel Hahnemann.

Coethen
January 27th, 1833.

Dear Colleague:—

I have not until now had the opportunity of answering your kind letter of April 5th, and of recommending to your care the Countess of Ingenheim, should she come to Naples. Two years ago she fled with her husband and sons from Paris, where the regular Physicians had nearly caused her death in their attempts to cure her. To save herself from these "Allopaths," she came to me for treatment in Coethen in mid-winter at the end of December 1827.

Every four to six weeks she suffered from a kind of cramping pain in the duodenal region, which attacked her in paroxysms. These pains began in Paris, and on account of the antipathic treatment, came oftener and with greater force, so that she screamed with pain at the top of her voice, failed to recognize her surroundings, and could find no relief, either lying down, walking, sitting or standing. Her face was distorted. She threw herself writhing on the floor, sprang up and ran about screaming, and threw herself down again, often vomiting. Lately, both during her stay in Paris and on her journey here, these attacks persisted for twenty-four hours at a time, through the day and night.

Locally I could find no abnormality except for extreme sensitivity to touch. During my treatment with antipsoric remedies, she had only one spontaneous attack, which proved to be slight, and a second caused through her own carelessness in taking a powder containing Camphor, intended for her son. Very often, however, without any real attack, she has local discomfort, which she describes as sometimes pressure and sometimes soreness. She also complains of sore throat, which she cannot clearly describe, and often suffers from hiccough (singultum). She is obstinate, and fusses about details. At present she is pregnant.

Should you be consulted in regard to these minor symptoms, it would be advisable to quiet her with placebo consisting only of milk sugar, as she must continue the antipsoric remedies that I have prescribed for her. The last powder, which she took about the beginning of August in Geneva, was a higher attenuation of Tr. Sulphur (spirit vini sulphur) namely $\frac{00}{X}$ Forty-eight days later she will take the twenty-four powders, No. 9 of which contains Natrum Muriaticum$\frac{0}{X}$. This new antipsoricum, common table salt, purified by recrystalization and highly potentized, becomes one of the strongest antipsoric remedies, and has afforded her the greatest benefit.

From Dr. Stapf you can obtain a better lithographic print of my picture than the small one enclosed in your letters, which is a very poor likeness. He can also send you a medal, that was made in honor of the anniversary of my Doctor's degree.

God bless you!

May you remember with affection

Your most devoted

Samuel Hahnemann.

Coethen, September 4th, 1829.

Hahnemann's use of the term "antipsoric" remedies refers to his theory that many chronic diseases are caused by a constitutional "taint," which may be hereditary; and that this is often manifested by various skin eruptions, which he termed "Psora."

The symbols following the drugs refer to his method of dilution ("medicaments au globule"). He was constantly experimenting with dosage and methods of administration; and apparently at this time he was advocating the use of medicines by inhalation. Later he abandoned this method.

The reference to "Mesmerism" is natural. When Mesmer first propounded his theories in Vienna in 1777, Hahnemann was a protege of, and assistant to, Von Quarin, Physician to Maria Theresa and the Emperor Joseph; Hahnemann must have known at first hand of Mesmer and his strange new theories. That he was impressed with them is evident from the advice given in this, as well as in other letters.

It is hard for the present generation to realize the bitterness and hatred that Hahnemann's teachings aroused in Europe and America. To one who studies his life it is clear that he is intolerant and bigoted, but equally clear that he was a great rebel and reformer. In medical history he is an outstanding personality during a period when there were few figures of importance.

THE EARLIEST MODERN LAW FOR THE REGULATION OF THE PRACTICE OF MEDICINE

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In an editorial published some thirty years ago *The Journal of the American Medical Association* called attention to the first law for the regulation of the practice of medicine of which we have any definite record in modern history. It contains so many clauses that were meant to correct abuses, with which the medical profession is concerned at the present moment, so many definite directions as to the relations of physicians to the community, to the authorities and to druggists, which we are prone to think that the medical profession and our legislators have only come properly to consider in recent years, that it has seemed worth while to present it in its entirety. It is to be found in "Studies in the History of Anatomy in the Middle Ages," by Robert Ritter von Töply,[1] which is one of the important contributions in the history of medicine made in recent years. The book is comparatively little known in America and that makes it all the more advisable to present the actual words of the law, for it is represented only in abstracts in the histories of medicine written by Haeser and Puschmann.

According to Haeser, the law was published in 1241, or according to Winkelmann, in 1240. (Von Töply quotes it from Huillard-Brehollis' Diplomatic History of Fred-

erick II, with Documents, which consists of twelve quarto volumes. Paris, 1851-1861.) This is one of the wonderful sets of documents that came from Frederick II, surnamed the Hohenstaufen, the German Emperor of the time, whom most historians are agreed in proclaiming the most remarkable historical figure of the Middle Ages. He was the grandson of Frederick II, was elected king of the Romans in 1196, and his father dying the next year he was crowned king of Sicily. At this time the kingdom of Sicily included not only what we now call the island of Sicily, but also the lower part of Italy, which was then called Greater Sicily or the kingdom of Naples. This was all that Frederick inherited, but by his own efforts he succeeded in making himself the Emperor of Germany, or as the office was then called, because the incumbent was at least supposed to be a successor to the power of the Roman emperors, the Holy Roman Emperor. His genius for government will probably be best revealed to physicians at least by this wonderful piece of medical jurisprudence which we quote:

Law of Frederick II Regulating Medical Practice

"While we are bent on making regulations for the commonweal of our loyal subjects we keep ever under our observation the health of the individual. In consideration of the serious damage and the irreparable suffering which may occur as a consequence of the inexperience of physicians, we decree that in future no one who claims the title of physician, shall exercise the art of healing or dare to treat the ailing, except such as have before-hand in our University of Salerno passed a public examination under a regular teacher of medicine and been given a certificate, not only by the professor of medicine but also by one of our civil officials, which declares his trustworthiness of character and sufficiency of knowledge. This document must be presented to us, or in our absence from the kingdom, to the person who remains behind in our stead in the kingdom, and must be followed by the obtaining of a license to practice medicine either from us or from our representative aforesaid. Violation of this law is to be punished by con-

fiscation of goods and a year in prison for all those who in future dare to practice medicine without such permission from our authority.

"Since the students can not be expected to learn medical science unless they have previously been grounded in logic, we further decree that no one be permitted to take up the study of medical science without beforehand having devoted at least three full years to the study of logic.[2] After three years devoted to these studies he (the student) may, if he will, proceed to the study of medicine, provided always that during the prescribed time he devotes himself also to surgery, which is a part of medicine. After this, and not before, will he be given the license to practice, provided he has passed an examination, in legal form, as well as obtained a certificate from his teacher as to his studies in the preceding time. After having spent five years in study he shall not practice medicine until he has during a full year devoted himself to medical practice with advice and under the direction of an experienced physician. In the medical schools the professors shall during these five years devote themselves to the recognized books, both those of Hippocrates as well as those of Galen, and shall teach not only theoretic but also practical medicine.

"We also decree as a measure intended for the furtherance of public health that no surgeon shall be allowed to practice, unless he has a written certificate, which he must present to the professor in the medical faculty, stating that he has spent at least a year at that part of medicine which is necessary as a guide to the practice of surgery, and that, above all, he has learned the anatomy of the human body at the medical school, and is fully equipped in this department of medicine, without which neither operations of any kind can be undertaken with success nor fractures be properly treated.

"In every province of our kingdom which is under our legal authority, we decree that two prudent and trustworthy men whose names must be sent to our court, shall be appointed and bound by formal oath, under whose

inspection electuaries and syrups and other medicines be prepared according to law and only be sold after such inspection. In Salerno in particular we decree that this inspectorship shall be limited to those who have taken their degree as masters in physic.

"We also decree by the present law that no one in the kingdom except in Salerno or in Naples [in which were the two universities of the kingdom.—ED.] shall undertake to give lectures on medicine or surgery, or presume to assume the name of teacher, unless he shall have been very thoroughly examined in the presence of a government official and of a professor in the art of medicine. [No fake medical schools.—ED.]

"Every physician given a license to practice must take an oath that he shall faithfully fulfill all the requirements of the law, and in addition that whenever it comes to his knowledge that any apothecary has for sale drugs that are of less than normal strength, that he shall report him to the court, and besides that he shall give his advice to the poor without asking for any compensation. A physician shall visit his patient at least twice a day and at the wish of his patient once also at night, and shall charge him, in case the visit does not require him to go out of the village or beyond the walls of the city, not more than one-half tarrene in gold for each day's service.[3] From a patient whom he visits outside of the village or the wall of the town, he has a right to demand for a day's service not more than three tarrenes, to which may be added, however, his expenses, provided that he does not demand more than four tarrenes altogether.

"He (the regularly licensed physician) must not enter into any business relations with the apothecary nor must he take any of them under his protection nor incur any money obligations in their regard.[4] Nor must any licensed physician keep an apothecary's shop himself. Apothecaries must conduct their business with a certificate from a physician according to the regulations and on their own credit and responsibility, and they shall not be permitted to sell

their products without having taken an oath that all their drugs have been prepared in the prescribed form, without any fraud. The apothecary may derive the following profits from his sales: Such extracts and simples as he need not keep in stock for more than a year, before they may be employed, may be charged for at the rate of three tarrenes an ounce. [Ninety cents an ounce seems very dear, but this is the maximum.] Other medicines, however, which in consequence of the special conditions required for their preparation or for any other reason, the apothecary has to have in stock for more than a year, he may charge for at the rate of six tarrenes an ounce. Stations for the preparation of medicines may not be located anywhere but only in certain communities in the kingdom as we prescribe below.

"We decree also that the growers of plants meant for medical purpose shall be bound by a solemn oath that they shall prepare their medicines conscientiously according to the rules of their art, and so far as it is humanly possible that they shall prepare them in the presence of the inspectors. Violations of this law shall be punished by the confiscation of their movable goods. If the inspectors, however, to whose fidelity to duty the keeping of the regulations is committed, should allow any fraud in the matters that are entrusted to them, they shall be condemned to punishment by death." [The first pure drug law.—ED.]

DIPLOMA

The diploma which went with the law and which we would call a license, is very interesting as an anticipation of many modern ideas. It runs as follows:

"We hereby make it known to all our loyal citizens that our loyal citizen, N. M., having presented himself at our court and been properly examined, has been recognized by the court as a loyal citizen and one descended from a worthy race and as properly fitted for the practice of the medical art. Therefore, we convinced of his knowledge and his readiness to obey the laws, after receiving his oath of fidelity to us and his oath to exercise his profession in a true

manner according to the customs of physicians, granted him the license to practice the medical art in every part of our kingdom, on condition that he exercise his art faithfully as becomes our dignity and our fidelity to our subjects, as well as for the good health of those who need his services. Therefore, we bring this matter to the knowledge of our faithful subjects so that no one may disturb this our loyal subject, N. M., aforesaid, in the practice of his art nor in any way hinder him in any part of our domains."

This is so different from what is usually thought to have been the condition of medical practice and so striking an anticipation of everything that is most modern in the regulation of medicine that one almost hesitates to accept it as authentic. A word as to its authoritativeness and as to the channel through which is comes may not be out of place. There is no doubt that it is an original document of the time of Frederick II. It occurs in connection with other documents of undoubted origin and date. As already stated, the present version comes to us through the German of Robert Ritter von Töply, who is considered probably the best living authority in Germany on the history of medicine, and especially anatomy in the Middle Ages. He was selected by the editors of Puschmann's "Handbook of the History of Medicine," the most recent authoritative work on the subject, to write the chapters on the history of anatomy in the Middle Ages.

1. Studien Zur Getschichte der Anatomie im Mittelalter, Robert Ritter von Töply, Leipzig und Wien, Franz Deutlicke, 1898.

2. Under logic at this time was included the study of practically all the subjects that are now taken up in the arts department of our universities. Huxley, in his address before the University of Aberdeen, on the occasion of his inauguration as rector of that university said: "The scholars (of the early days of the universities, first half of the thirteenth century) studied grammar, rhetoric, arithmetic and geometry, astronomy, theology and music." He added: "Thus their work, however imperfect and faulty judged by modern lights, it may have been, brought them face to face with all the leading aspects of the many-sided mind of man. For these studies did really contain, at any rate in embryo—sometimes, it may be, in caricature—what we now call philosophy, mathematical and physical science, and art. And I doubt if the curriculum of any modern university

shows so clear and generous a comprehension of what is meant by culture as the old trivium and quadrivium does." Science and Education Essays, page 197; New York, D. Appleton & Co. 1896.

3. A tarrenus or tarrene in gold was equal to about thirty cents of our money. Money at that time had from ten to fifteen times the purchasing power that it has at the present time. An ordinary workman at this time in England received about four pence a day, which was just the price of a pair of shoes, while a fat goose could be bought for two and a half pence, a sheep for one shilling two pence, a fat hog for three shillings, and a stall-fed ox for 16 shillings (Act of Edward III fixing prices).

4. Apparently many different ways of getting round this regulation had already been invented and the idea of these expressions seems to be to make it very clear in the law that any such business relationship no matter what the excuse or the method of it, is forbidden.—Ed.

Reprinted with Permission from the Journal of the
American Medical Association,
February 1, 1908, Vol. I, pp. 388, 389.

CORRECTION

Continuation of Discussion of Dr. Goodman's Paper on "A SKIN TEST TO SUGGEST THE DIAGNOSIS OF RECOVERED TYPHUS AND THROMBO-ANGIITIS," Published in the JUNE BULLETIN OF THE NEW YORK ACADEMY OF MEDICINE

(Due to stenographic errors in reporting, this discussion is printed in corrected form.)

DR. JOSEPH HARKAVY: The observations of Dr. Goodman are certainly interesting. If I understand him correctly he reports that he has obtained positive skin reactions with a formalinized Rickettsia suspension in a series of cases who had typhus fever and negative reactions in normal controls, who gave no history of typhus. Similar positive skin reactions to the Rickettsia suspension were found by him in a group of patients suffering from thrombo-angiitis obliterans. On the basis of this association Dr. Goodman reasons that these patients must have had typhus

in some form and hence he claims there is the possibility that thrombo-angiitis obliterans is related to typhus fever infection.

It seems to me that while Dr. Goodman's findings might tempt him to reach the above conclusions, detailed analysis of the facts scarcely warrants such an assumption.

To begin with it is well known that occlusive vascular involvement may occur in many infectious diseases. In typhoid fever, thrombo-phlebitis with ulceration of the involved extremity and arteritis followed by gangrene, have often been reported. Incrimination of the typhoid bacilli as a cause of the thrombosis because of recovery of these organisms from the affected blood vessels has been open to the objection that the bacilli may merely have been present in the blood stream and were incorporated in the thrombi.

In typhus fever the vessels of the brain, skin, skeletal muscles and some viscera are notoriously involved. Wollbach states that typhus is a disease of the smaller vessels. The presence of Rickettsia bodies in such vessels is probably likewise evidence of a general blood stream invasion.

The finding of positive skin reactions to the Rickettsia bodies in individuals who have had typhus fever is not surprising for skin sensitization to the organism responsible for a generalized infection, may frequently follow.

It so happens that many of our cases of thrombo-angiitis obliterans in New York come from Eastern Europe where typhus is prevalent. Some of these may have had typhus and hence developed skin sensitiveness to the Rickettsia bodies. We have, however, also seen numerous patients with thrombo-angiitis obliterans from other parts of the world, who never have had typhus and many who with the exception of childhood infections were completely well until the onset of their vascular impairment.

Skin tests alone cannot settle this question. On the basis of the fact that a general bacterial infection can be followed by a skin sensitization to the invading micro-organism, I should expect a patient with thrombo-angiitis obliterans to

react to streptococcus filtrate or streptococcus nucleoprotein, if he has had a streptococcus infection, or, for that matter, to any other micro-organisms with which his blood stream may have been invaded.

Everybody knows that a positive Widal may be found 20 years or longer after a typhoid infection, and it may also persist for a long time in those who only received typhoid vaccine prophylactically. Yet I am certain that in the presence of a positive Widal or positive skin reaction to a streptococcus filtrate in a patient with thrombo-angiitis obliterans, Dr. Goodman would not be willing to assume that the thrombo-angiitis obliterans was due to some streptococcus infection, to typhoid, or any other bacteria.

Skin reactions to Rickettsia bodies are subject to the same limitations as any other skin reactions. Before one can say that an antigen which induces a positive skin reaction is etiologically significant one must be able to reproduce symptoms of the disease in question by introducing the antigen into the body, or cause a cessation of symptoms by the withdrawal of this agent. We know that cessation in the use of tobacco brings thrombo-angiitis obliterans under control. This is the experience of Dr. Silbert in over a thousand cases, as well as of other workers in this field. Thrombo-angiitis obliterans may be completely arrested in the early stages on withdrawal of tobacco.

There is one possible theoretical explanation of the role of typhus fever or any other general infectious disease occurring in individuals with constitutionally vulnerable vascular systems (i.e. allergic individuals), and that is, that the toxins of the invading micro-organisms may sensitize that kind of vascular system so that it becomes a shock organ, if it is not already such by virtue of inheritance. Subsequent repeated contact with unrelated antigens, like tobacco for instance, may cause an inflammatory reaction in such sensitized blood vessels which may result in more or less permanent damage. This would in a sense be comparable to the Shwartzman phenomenon.

RECENT ACCESSIONS TO THE LIBRARY

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DEATHS OF FELLOWS OF THE ACADEMY

Asch, Joseph Jeffeeson, M.D., 111 East 80 Street, New York City; graduated in medicine from the College of Physicians and Surgeons, New York City, in 1902; elected a Fellow of the Academy March 6, 1913; died August 15, 1935. Dr. Asch was a member of the American Medical Association, of the American Urological Society, of the American Psychoanalytic Society, of the International Psychoanalytic Society, of the New York Urological Society, of the New York Psychoanalytic Society, and of the Alumni Society of the Lenox Hill Hospital. He was Cystoscopist to the Lenox Hill Hospital and Consulting Surgeon to the Lenox Hill Hospital Dispensary.

Eisberg, Harry Belleville, M.D., 161 East 19 Street, New York City; graduated in medicine from University and Bellevue Hospital Medical College in 1913; elected a Fellow of the Academy January 3, 1924; died August 10, 1935. Dr. Eisberg was a member of the County and State Medical Societies, a Fellow of the American Medical Association, a Fellow of the American College of Surgeons, a member of the American Society for the Advancement of Science, and a member of the American Society for

Regional Anesthesia. He was Surgeon to Harlem, Riverside and Lutheran Hospitals, and Consulting Surgeon to the United States Marine, Ellis Island and North Hudson (Weehawken) Hospitals.

HENSEL, OTTO, PH.G., M.D., 935 Park Avenue, New York City; graduated in medicine from the College of Physicians and Surgeons in 1900; elected a Fellow of the Academy December 3, 1908; died July 13, 1935. Dr. Hensel was a member of the County and State Medical Societies and a Fellow of the American Medical Association. He was physician to Lenox Hill Hospital.

KIRBY, GEORGE HUGHES, M.D., 1010 Fifth Avenue, New York City; graduated in medicine from the Long Island College Hospital Medical College in 1899; elected a Fellow of the Academy May 2, 1918; died August 11, 1935. Dr. Kirby was a member of the American Psychiatric Society, of the American Neurologic Society, of the Society for Clinical Psychiatry, and past president of the Psychiatric Society and of the Neurological Society. He was Consulting Psychiatrist to the Presbyterian Hospital and the Psychiatric Institute, and Psychiatrist to the New York Hospital. Dr. Kirby was for some time Professor of Psychiatry in Cornell Medical College and in the College of Physicians and Surgeons. In 1917 he became Director of the New York State Psychiatric Institute and planned and carried to completion the new Institute as a unit of the Columbia-Presbyterian Medical Center. He was the author of many articles on psychiatric subjects.

MILLER, GEORGE NORTON, B.A., M.D., 943 Lexington Avenue, New York City; graduated in medicine from Harvard University Medical School in 1882; elected a Fellow of the Academy December 15, 1904; died July 30, 1935.

RICE, CLARENCE CHARLES, M.D., 52 Park Avenue; graduated in medicine from the College of Physicians and Surgeons in 1877; elected a Fellow of the Academy April 7, 1887; died July 5, 1935. Dr. Rice was a member of the County and State Medical Societies, the American Laryngological Society and the Pathological Society. At the time of his death Dr. Rice was Emeritus Professor of Laryngology at Post-Graduate Hospital.

SILVER, LEWIS MANN, B.A., M.D., 101 West 72 Street, New York City; graduated from Yale University in 1882 (B.A.); graduated in medicine from Bellevue Hospital Medical College in 1885; elected a Fellow of the Academy April 6, 1893; died August 14, 1935. Dr. Silver was a member of the State and County Medical Societies, a Fellow of the American Medical Association, a Fellow of the American College of Physicians and a member of the Society of Alumni of Bellevue Hospital Medical College.

WELKER, FRANKLIN, M.D., 638 West 174 Street, New York City; graduated in medicine from the University of Pennsylvania in 1894; elected a Fellow of the Academy January 7, 1909; died July 17, 1935. Dr. Welker was a member of the County and State Medical Societies, the National Tuberculosis Association, the American Congress of International Medicine, the Kings County Hospital Alumni Club, and a Fellow of the American Medical Association and the American College of Physicians. At the time of his death Dr. Welker was President of the County Medical Society and Medical Director of Lutheran Hospital.